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PROBLEMS FOR SOLUTION.

ALGEBRA.

240. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

Solve $a^2x + b^2y = ax^2 + by^2 = x^3 + y^3$.

241. Proposed by L. E. NEWCOMB, Los Gatos, Cal.

Sum to infinity $\frac{1}{2} + \frac{1}{3} + \frac{1}{8} + \frac{1}{30} + \frac{1}{840} + \dots$

242. Proposed by DR. L. E. DICKSON, The University of Chicago.

If $u_0^i h_0 + u_1^i h_1 + \dots + u_r^i h_r = 0$ ($i=0, 1, \dots, r-1$), then $h_i \prod_{\substack{j=0, 1, \dots, r \\ j \text{ not } = i}} (u_i - u_j) = 0$.

243. Proposed by WILLIAM HOOVER, Ph. D., Athens, Ohio.

Find the infinite root of $\frac{1}{x} + \frac{1}{a} = \sqrt{\left[\frac{1}{a^2} - \sqrt{\frac{1}{a^2 x^2} + \frac{1}{x^4}} \right]}$.

AVERAGE AND PROBABILITY.

168. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Find the average area of a triangle two of whose sides have the constant sum $2a$.

169. Proposed by HENRY HEATON, Atlantic, Iowa.

What is the average length of all straight lines that can be drawn within a given square?

170. Proposed by LON C. WALKER, Santa Barbara, Cal.

Find the area of a triangle formed by drawing a line at random through each of the three points taken at random within the surface of a given triangle.

171. Proposed by O. E. GLENN, A. M., Ph. D., Drury College.

There are n derelict steamers afloat in a circular sea of radius r . The water in the sea is moving northward in a current whose velocity varies inversely as the perpendicular distance from the north-south tangent to the sea on its west beach. Find the probability that a ship crossing the sea on a random diameter will encounter e derelicts during the voyage.

CALCULUS.

202. Proposed by W. J. GREENSTREET, M. A., Editor of the Mathematical Gazette, Stroud, England.

Find the complete primitive of $y = 2px + ap^2$. Regard the primitive as the equation giving the arbitrary constant, and if the primitive has equal roots discuss the equation expressing that condition.